3.0 MPA Identification: Methods and Results

A primary objective of this study is to create a centralized information source on MPAs in Puget Sound. Fundamental to this is the need to identify existing MPAs, and further to categorize and profile these sites.

This section describes the general approach used to identify the marine protected areas discussed in this study, and the MPA categorization scheme adopted for use. The type of information collected at the site level is also described. Identified MPAs are listed, and site locations are mapped. Finally, an explanation is provided concerning the known limits of this study, specifically related to the comprehensiveness of MPA identification.

3.1 Methodology

Described here is the approach used to find protected areas in Puget Sound, develop a categorization scheme, and profile individual sites.

3.1.1 Finding MPAs

MPAs are still a relatively new topic of discussion in the Puget Sound region, although in recent years considerable attention has been focused on the establishment of new MPAs. However, cross-program and multiple-site sources of information about the collection of *existing* MPAs in the region are essentially non-existent. MPAs are not yet represented in any comprehensive map, geographic information system (GIS) or database for the area. As a result, MPA identification proved to be the most challenging aspect of this study.

Starting from an MPA definition adopted for this study, the identification of and collection of information about protected areas in Puget Sound was carried out using three primary approaches: surveys, interviews and literature review.

MPA Definition

The definition of a marine protected area provides a fundamental starting point for identifying existing sites in Puget Sound. For this study, the IUCN-adopted MPA definition presented at Section 2.1.1 was used[1].

Some MPA inventories have altered this definition, or started from a different definition altogether, such that sites included are limited to those with a subtidal component (e.g., Kelleher et al. 1995; McArdle 1997). In this study, however, consistent with the IUCN definition, protected areas with only intertidal components are also considered as possible MPAs. Additionally, upland protected areas located along shorelines were not considered for MPA identification in this study unless containing intertidal area within site their boundaries.

Surveys

In the fall of 1996, when this study was first begun, the Washington Marine Protected Areas Work Group had started the process of identifying and profiling MPAs in Puget Sound. At that time, the method that had been used to gather this information was distribution of an MPA Questionnaire (**Appendix A1**). This survey form had been designed by the MPA Work Group, and was distributed in the winter of 1995/96 to a small group government agency contacts at the Washington Department of Fish and Wildlife (WDFW), the Washington Department of Natural Resources (DNR), the Washington State Parks and Recreation Commission (WSP&RC) and the U.S. Fish and Wildlife Service (USFWS). Return of these first surveys was limited, representing fewer than six MPAs, plus eight other sites. For the surveys submitted, there were often significant gaps in information.

In November of 1996, a revised MPA site questionnaire was designed for this study (see **Appendix A2**). In the course of conducting interviews, contacts were asked if they would be willing to complete this survey. Eight surveys were distributed in this manner (with four being returned), after which the questionnaire was no longer distributed due to incomplete responses. This questionnaire did, however, continue to guide information collection during interviews.

Overall, the use of surveys for this study was not systematic or comprehensive. However, for a small number of MPAs, willing participants did use the survey form to provide important site details.

Interviews

Because many site details were not available in literature sources, and because distribution and collection of site questionnaires proved to be largely unreliable, this study relied heavily upon personal interviews as a primary approach to gathering information.

A wide variety of contacts were interviewed, including on-site managers or staff, government agency staff involved with protected area programs, state and local government planners, researchers, volunteers, and many others that could be contacted and that had specific knowledge about the MPAs discussed in this study. The high proportion of "personal communication" entries listed in the References section of this report attests to the importance so many individuals played in bringing together information used in this study.

Some interviews were conducted on site. Site visits were also helpful for gaining a better understanding of site location, access, and viewing interpretive displays or other facilities.

While the interview process was vital to this study, for some sites it was difficult to find appropriate contacts with knowledge about the kinds details being sought. This factor revealed that some MPA sites, often those without on-site staff or other assigned personnel, are minimally understood, studied, and/or attended to. At some sites, tasks such as planning, operation and supervision are handled by staff that have many other responsibilities, which often translates to lower site-specific knowledge or involvement, and was a limiting factor concerning staff time availability for interviews and information retrieval. In short, some staff were just too busy to respond to the requests for details being sought in this study.

For other sites, on-site contacts existed but interviews were not conducted. For example, State Parks in Puget Sound were so numerous (60 sites) that it was not practical to conduct interviews with individual park managers. Various park planners and other specialists provided the information.

Literature

A patchwork of mostly site- and program-specific literature was reviewed to assist in identifying MPAs, finding site details, and for understanding institutional arrangements. Included among this diverse collection of literature, other printed materials and on line resources were the following:

- Site plans. These documents, where they existed, were often the most detailed sources of printed information about specific MPA sites. Site management plans, old, new or in draft, were often the most helpful of all. In some cases, pre-designation recommendation plans or assessment reports were available. Also referenced were master or comprehensive plans which, although they often encompassed broader areas than a single MPA site, contained some useful site-specific or programmatic information.

- Agency reports. These consisted of a wide variety of state and federal agency reports on programs related to protected area establishment and management. These sources included strategic plans, program status reports, annual reports and other documents. Of special note here is the 1993/95 State of Washington Natural Heritage Plan (DNR 1995), which is unique in that it identifies many of the state's protected area designations.
- Site brochures and other printed public-use informational materials.
- Site-specific scientific research studies and surveys.
- Public agency records. For some sites, archived public records on file at state agencies were instrumental in gaining a historical perspective on such details as site designation processes and the original objectives driving protected area establishments.
- Graduate student papers. Of special note here are contributions made by graduate students from the University of Washington. In recent years, students have analyzed Washington State policies concerning MPAs and proposed strategies for improvement. Eng (unpublished, 1993) discussed the need for a comprehensive state policy on MPAs, building on a primary analysis of programs and policies of the Washington Department of Natural Resources (DNR). Condello (unpublished, 1996) provided a comprehensive legal and policy examination of Washington State environmental regimes regulating conservation, protection and private use of marine resources. In 1996, Professor D. Fluharty of the University of Washington's School of Marine Affairs conducted a graduate seminar course on marine protected areas. Students were challenged with analyzing Washington State policy and developing marine protected area strategies for the state; the resulting papers were made available to state agency MPA planners and other interested individuals. This course was repeated in 1997, and student papers were again made available in a compendium series (UW SMA 1997).
- Internet Resources. In some cases, up-to-date institutional information and site details unavailable in print were found on-line at web sites maintained by state agencies, federal agencies, and other governmental and private sector institutions.
- Recreational guide books. Helpful in some cases for finding various site details were books and guides on parks, fishing, wildlife viewing, scuba diving and boating in Puget Sound.
- Laws and Legal Text. These legal resources included the 1996 Washington Administrative Code (and 1997 updates), the 1996 Revised Code of Washington, and selected texts of local government ordinances and code.
- Maps. These included a wide variety DNR public lands maps, NOAA navigational charts, US Geographical Survey charts, and numerous others.

3.1.2 MPA Categorization Scheme

Puget Sound MPAs represent a wide variety of protected area types known by an assortment of names. These sites are referred to with designation terms such as marine preserves, research reserves, fishery management areas, conservation areas, wildlife refuges, wildlife areas, sanctuaries, state parks, and so on. To assist in organization and discussion of these various protected areas, a categorization scheme was developed to distinguish MPAs by primary site objectives or purpose.

Categorization Development and Limitations

The development of a categorization scheme for Puget Sound MPAs builds on the related work of others. In a review of MPA models developed around the world, de Macedo (1995) referenced and categorized a small number of Washington State MPAs. The Washington MPA Work Group (1996), in preparation for developing state MPA strategies and based on their knowledge of local sites, developed a scheme of marine preserve categories. The MPA categories developed for this study are derived from these works, with a few adaptations

incorporated to accommodate specific Puget Sound protected area characteristics and limitations.

It should be noted that while few MPAs have been designated for or serve only a single purpose, it is still possible in most cases to associate a site with an intended primary objective or function. A primary objective in many cases is identified as one which, more than others, was the driving incentive for protected area designation. In other cases, where multiple objectives may be documented for an MPA, the actual use and management of the site suggests one function as being more prominent than others. To this end, the MPA categories used in this study are organized along a scheme which separates sites by primary objectives or functions. A multiple-use category is also provided to characterize those MPAs for which a single predominant objective could not be identified, or for which multiple use is a primary tenant. Additionally, separate categories have been established for proposed MPAs and those sites that may be considered MPAs but require further investigation.

When constructing a set of categories, there is always the problem that over-generalization or limitation may occur, thus blurring the character or purpose of a particular protected area. For example, a common problem is that some MPAs appear to fit into more than one category. Additionally, it is expected that with any assignment of sites to categories custom-developed for a particular study, opinions are likely to differ among various readers regarding the assignments made. Because of these factors, the categorization scheme used in this study, while helpful for facilitating organized discussion, is tempered somewhat in its application throughout this report. Use of the developed scheme should not be regarded as providing a critical element to support analyses presented.

The Categories

The marine protected area categories used in this study are as follows:

- Research and Educational Marine Preserves
- Recreational Marine Preserves
- Marine Species Preserves
- Marine Habitat/Species Preserves
- Multiple Use Protected Areas
- Potential/Possible MPAs
- Proposed MPAs

These categories are individually described below.

Research and Educational Marine Preserves

The Research and Educational Marine Preserve category represents sites that have been established with an express purpose of providing opportunity for the study of marine resources in relatively undisturbed settings (de Macedo 1995). Such preserves can provide valuable baseline data for present and future comparisons of protected and unprotected sites. Depending upon the specific resource or ecosystem in need of protection to support research or educational activities, these preserves may or may not be associated with restrictions on harvesting of marine life.

Recreational Marine Preserves

The Recreational Marine Preserve category characterizes sites that are set aside primarily for the non-consumptive use of marine resources in a park-like setting (de Macedo 1995). These sites may often be chosen for their

aesthetic or recreational values rather than ecological importance.

Marine Species Preserves

The Marine Species Preserve category is assigned to those sites which function primarily as tools to help meet species-specific or multiple species fishery management goals (Washington MPA Work Group 1996). As harvest refugia for specific species, Marine Species Preserves can conserve stocks threatened by overexploitation or destructive fishing practices; help to maintain genetic diversity; protect spawning stock biomass; simplify management and enforcement approaches; provide a baseline to monitor the condition of stocks and the productivity or health of marine ecosystems; and provide insurance against traditional fisheries management failure (Agardy 1994b).

Marine Habitat/Nature Preserves

The Marine Habitat/Nature Preserve category represents those sites that exist primarily to preserve assemblages of flora and fauna within an ecosystem. They are often established to protect outstanding ecosystems and natural features, endangered species, areas of scientific importance or areas representative of particular natural areas (de Macedo 1995; Salm and Clark 1984). They often contain fragile ecosystems or life forms and represent areas of important biological or geological diversity (Salm and Clark 1984).

Multiple Use Protected Areas

The establishment of "multiple use" protected areas in the marine environment is a common approach to marine conservation. Multiple use MPAs are often noted as serving multiple objectives, and may facilitate combinations of activities such as research, education, recreation, and consumptive and non-consumptive uses while striving to protect special habitats or resources. Larger multiple use MPAs may be zoned to separate conflicting uses and minimize sensitive area or resource impacts.

For this study, the category of Multiple Use Protected Area has been assigned primarily to sites that have set aside area for habitat or species protection, while still facilitating compatible human uses, including the harvest of marine resources.

Potential/Possible MPAs

This category was created for this study to represent those sites which might be considered MPAs, but such determination was questionable due to: (1) lack of available data on the site's marine area boundaries and/or management; or (2) uncertainty as to whether or how the site functions to protect the marine environment or resources. Further study and closer investigation of these sites, beyond the scope of this preliminary assessment, would be necessary to identify all such areas and definitively include or exclude them from a list of MPAs. Section 3.3 further discusses the limits of this study's identification of MPA sites.

Proposed MPAs

This category was created for MPAs under consideration for designation pursuant to the various statutes and programs described in Section 4.0.

3.1.3 MPA Site Profiling

Beyond identification and categorization, this study attempts to document site-specific details for Puget Sound MPAs. The general approach taken focused on gathering basic information on site parameters and management operations. Detailed ecological assessments or information related to site effectiveness was not pursued.

The type of information sought for each MPA in the study area can be roughly characterized as fitting into three categories: 1) general site information; 2) site location and boundaries; and 3) site protection and management.

General Site Information

At the most basic level, the following information was sought for each site:

- Site name
- Designation type
- Date of establishment/designation
- Establishing agency or organization
- Managing agency or organization
- Purpose, goals and/or objectives for the site
- Legal authority (if any) under which the site is established and managed
- Natural and/or cultural resource highlights

Site Location and Boundaries

In order to gain a spatial understanding of the various MPAs and allow for basic location mapping, the following geographic information was sought for each site:

- Location/vicinity description
- Marine boundary identification and description (intertidal and subtidal)
- Identification of overlapping or abutting MPAs
- Size/acreage breakdown (if possible) for upland, intertidal and subtidal components

Site Protection and Management

Finally, in order to understand the level of protection specifically provided to marine species and habitats, and to gain perspective on the extent and nature of on-site management activities, the following information was sought for each site:

- Legal citation and description of site-specific restrictions on human activities to protect marine resources
- Description of other marine resource protection mechanisms (proprietary access controls, voluntary compliance policies, etc.)
- Management or master plan status, and marine resource emphasis therein
- Designation process or history
- Management planning process
- Extent and nature of site supervision and enforcement
- General information on additional programs, such as: research, monitoring, education, outreach, public involvement, etc.

Marine-associated Site Details Missing

Collection of the above-described site information was in many cases hindered by a lack of documented details concerning the marine components (intertidal and subtidal portions) of protected areas. Site elements of interest for this study that are most commonly unavailable or unclear include the following:

- Clear identification and description of marine boundaries (intertidal and subtidal). Maps and management plans (when they exist) often don't clearly display or explain marine component boundaries.
- Size/acreage breakdown for intertidal and subtidal components. Surveys to measure, or existing information on, the size of marine areas contained within protected areas is often not performed or available. With scattered data, information on size and area is often inconsistent.
- Information on marine resources (natural and/or cultural) and resource values, specific to the site. The resource information base from which many protected areas operate, especially but not exclusively those that are primarily land-attached, lacks emphasis on the marine environment contained within and adjacent to site boundaries.

3.2 Results: MPAs Identified

Based on the approach taken, 102 Puget Sound protected areas are identified in this study and recognized as existing MPAs. Of the 102 protected area designations, some have noncontiguous components included in a single designation. For example, the San Juan Islands National Wildlife Refuge is a single MPA, but encompasses 83 separate rocks, reefs and islands.

It is important to note that these 102 MPAs are not presented in this study as a complete MPA inventory, but rather a first attempt and preliminary assessment. In addition to the 102 existing MPAs, further sites have been identified and are categorized as Potential/Possible and Proposed MPAs. It is likely more sites beyond these exist, especially considering the broad MPA definition adopted for this study (and presented at Section 2.1.1). Refer to Section 3.3 for an explanation of this study's limits regarding MPA identification.

Appendix B, a matrix of MPAs, lists by category each of the identified MPAs, and presents information on the following elements:

- designation type
- primary managing agency or organization
- number of physical sites
- year of establishment
- predominant component (upland, intertidal or subtidal)
- component sizes in acres (where known)
- total size in acres (where known)
- primary purpose or objectives
- fishing restrictions, marine resource protections, or related comment

Appendix B also presents similar information on additional sites assigned to the Potential/Possible and Proposed MPA categories.

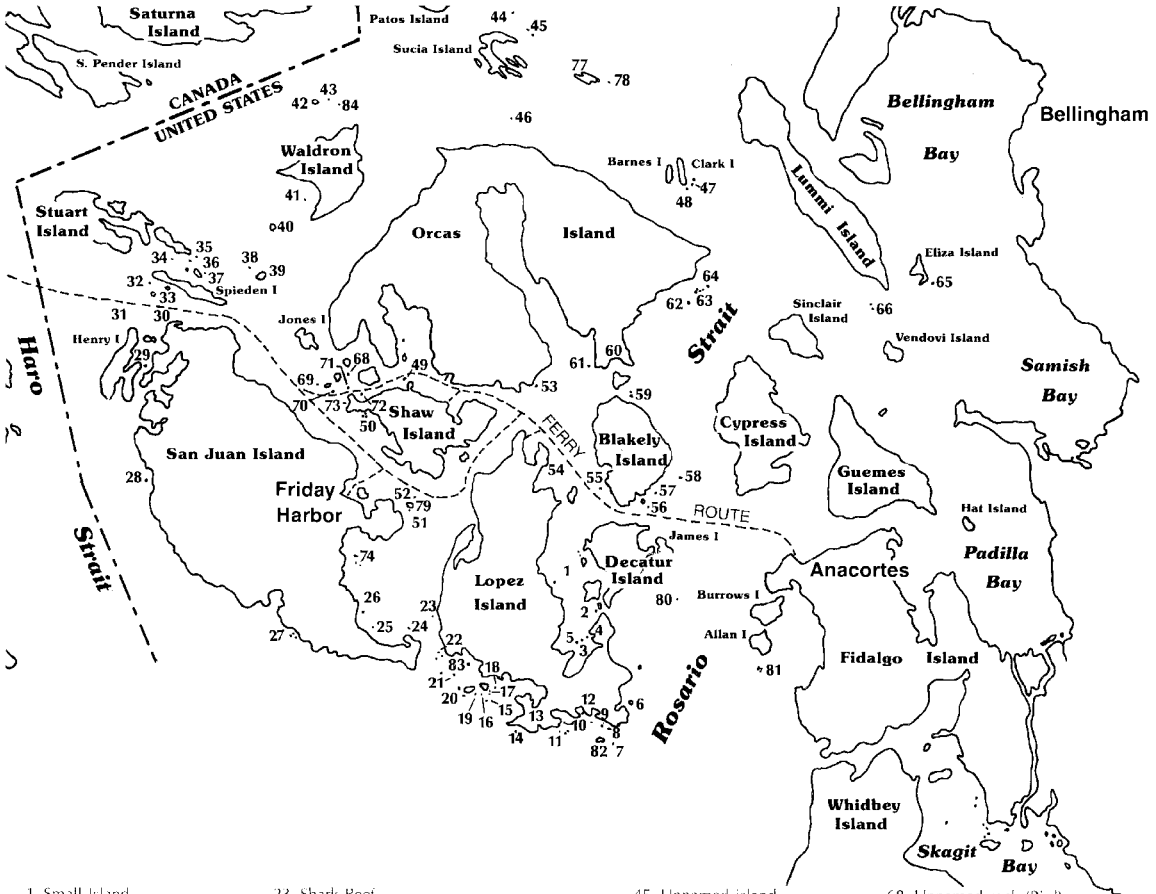
Additional site details pursued in this study (as previously mentioned) are presented in **Volume 2, MPA Site Profiles**. This supplemental reference provides site-by-site profiles for many of the identified MPAs.

3.2.1 Location, Designation Type and Category Assignment of Existing MPAs

Maps were created to show the general location of MPAs identified in this study. **Map 2A** points out the location of all existing MPAs. Additionally, because one multiple-site MPA (the San Juan Islands National Wildlife Refuge) contains 83 separate islands, rocks and reefs, it is detailed at **Map 2B**. For each of the 102 MPAs, the **Map 2 Index** lists site name, designation type, and primary agency or organization. The index also indicates the MPA category assigned to each MPA.

Map 2A. Marine Protected Areas of Puget Sound

Map 2B. Marine Protected Areas of Puget Sound (continued): San Juan Islands National Wildlife Refuge



1. Small Island
2. 2 unnamed islands
3. Unnamed island (Fortress)
4. Unnamed island (Skull)
5. Unnamed island (Crab)
6. Boulder Island
7. Davidson Rock
8. Castle Island
9. 3 unnamed islands
10. Aleck Rocks
11. Unnamed island (Swirl)
12. Unnamed rock
13. 4 unnamed islands
14. 3 unnamed islands
15. Hail Island
16. Unnamed island
17. Secar Rock
18. Unnamed rock (Round Rock)
19. 3 unnamed islets
20. 13 unnamed islets
21. Mummy Rocks
22. Islets and rocks
23. Shark Reef
24. Harbor Rock
25. Unnamed rock (N. Pacific Rock)
26. Half Tide Rocks
27. 7 unnamed islands
28. Low Island
29. Unnamed island (Pole)
30. Barren Island
31. Battleship Island
32. Unnamed rock (Sentinel)
33. Center Reef
34. Gull Reef
35. Ripple Island
36. Unnamed reef (Shag)
37. Unnamed island (L. Cactus)
38. Gull Rock
39. Flattop Island
40. White Rocks
41. Mouatt Reef
42. Skipjack Island
43. Unnamed island
44. Clements Reef
45. Unnamed island
46. Parker Reef
47. The Sisters
48. Unnamed island (L. Sister)
49. Unnamed islet
50. Tift Rocks
51. Unnamed rock
52. Turn Rock
53. Shag Rock
54. Flower Island
55. Willow Island
56. Lawson Rock
57. Pointer Island
58. Black Rock
59. 3 unnamed rocks
60. Brown Rocks
61. Unnamed rock
62. S. Peapod Rock
63. Peapod Rocks
64. N. Peapod Rock
65. Eliza Rock
66. Viti Rocks
68. Unnamed rock (Bird)
69. Unnamed island
70. Low Island
71. Unknown island (Nob)
72. Unnamed island
73. Unnamed island
74. Unnamed rocks
75. Smith Island (Non-wilderness Status)
76. Minor Island (Non-wilderness Status)
77. Matia Island
78. Puffin Island
79. Turn Island (Non-wilderness Status)
80. Four Bird Rocks
81. Three Williamson Rocks
82. Colville Island
83. Buck Island
84. Bare Island

Map source: United States Fish and Wildlife Service

Map 2. Index

MAP #	Name or Location	Designation	Agency/Org
1	Friday Harbor to Pt Caution	San Juan Islands Marine Preserve Area	WDFW; FHL
2	Yellow and Low Islands	San Juan Islands Marine Preserve Area	WDFW; FHL
3	False Bay	San Juan Islands Marine Preserve Area	WDFW; FHL
4	Argyle Lagoon	San Juan Islands Marine Preserve Area	WDFW; FHL
5	SW Shaw Island	San Juan Islands Marine Preserve Area	WDFW; FHL
6	San Juan County/Cypress I.	Marine Biological Preserve	FHL
7	Padilla Bay	National Estuarine Research Reserve	Ecology
8	Edmonds Underwater Park	Underwater Park	City of Edmonds
9	Sund Rock	Marine Preserve Area	WDFW
10	Haro Strait	Special Management Fishery Area	WDFW
11	San Juan & Upright Channel	Special Management Fishery Area	WDFW
12	Point Lawrence	Voluntary No-Take Bottom Fish Recovery Area	San Juan Cnty.
13	Bell Island	Voluntary No-Take Bottom Fish Recovery Area	San Juan Cnty.
14	Charles Island	Voluntary No-Take Bottom Fish Recovery Area	San Juan Cnty.
15	Pile Point	Voluntary No-Take Bottom Fish Recovery Area	San Juan Cnty.
16	Lime Kiln Lighthouse	Voluntary No-Take Bottom Fish Recovery Area	San Juan Cnty.
17	Kellett Bluff	Voluntary No-Take Bottom Fish Recovery Area	San Juan Cnty.
18	Gull Rock	Voluntary No-Take Bottom Fish Recovery Area	San Juan Cnty.
19	Bare Island	Voluntary No-Take Bottom Fish Recovery Area	San Juan Cnty.
20	Dabob Bay	Natural Area Preserve	DNR
21	Kennedy Creek	Natural Area Preserve	DNR
22	Skookum Inlet	Natural Area Preserve	DNR
23	San Juan Islands (83 sites) (SEE Map 2B for detail)	National Wildlife Refuge	USFWS
24	Protection Island	National Wildlife Refuge	USFWS
25	Zella M. Schultz/ Protection Island	Seabird Sanctuary	WDFW/USFWS
26	Tongue Point	Marine Life Sanctuary	Clallam County
27	Yellow Island	Nature Conservancy Preserve	TNC
28	Chuckanut Island	Nature Conservancy Preserve	TNC
29	Foulweather Bluff	Nature Conservancy Preserve	TNC
30	Goose Island	Nature Conservancy Preserve	TNC
31	Deadman Island	Nature Conservancy Preserve	TNC
32	Sentinel Island	Nature Conservancy Preserve	TNC
33	Waldron Island	Nature Conservancy Preserve	TNC
34	Lummi Island	Natural Area Preserve	WDFW
35	Kimball Preserve/Decatur Isl.	San Juan Preservation Trust Preserve	SJPT
36	South Puget Sound	Wildlife Area	WDFW
37	Titlow Beach	Marine Park / Marine Preserve	METRO/Tacoma
38	Cypress Island	Natural Resources Conservation Area	DNR
39	Woodard Bay	Natural Resources Conservation Area	DNR
40	Dungeness	National Wildlife Refuge	USFWS
41	Nisqually	National Wildlife Refuge	USFWS
42	Skagit	Wildlife Area	WDFW

Sites (map #)	MPA Category
1-7	Research and Educational Marine Preserve
8-9	Recreational Marine Preserve
10-19	Marine Species Preserve
20-36	Marine Habitat/Nature Preserve
37-42, S1-S60	Multiple Use Protected Area

Abbreviations for Agencies and Organizations:

DNR - Washington Dept. of Natural Resources
Ecology - Washington Dept. of Ecology
TNC - The Nature Conservancy
SJPT - San Juan Preservation Trust
FHL - University of WA Friday Harbor Laboratories
USFWS - Untied States Fish & Wildlife Service
WDFW - Washington Department of Fish & Wildlife
METRO/Tacoma - Metropolitan Park District of Tacoma

State Park Areas (Designated/Developed State Parks and Marine State Parks)

S1	Sequim Bay State Park
S2	Camano Island S.P.
S3	Deception Pass S.P.
S4	Ebey's Landing
S5	Fort Casey State Park
S6	Fort Ebey State Park
S7	Joseph Whidbey S.P.
S8	South Whidbey S.P.
S9	Dosewallips State Park
S10	Fort Flagler State Park
S11	Fort Worden State Park
S12	Mystery Bay Marine S.P.
S13	Old Fort Townsend S.P.
S14	Pleasant Harbor S.P.
S15	Triton Cove State Park
S16	Dash Point State Park
S17	Saltwater State Park
S18	Blake Island S.P.
S19	Fay-Bainbridge S.P.
S20	Fort Ward State Park
S21	Harper State Park
S22	Illahee State Park
S23	Kitsap Memorial S.P.
S24	Manchester State Park
S25	Old Man House S.P.
S26	Scenic Beach S.P.
S27	Belfair State Park
S28	Harstine Island S.P.
S29	Hope Is. (S.) Marine S.P.
S30	Jarrell Cove State Park
S31	McMicken Is. Marine S.P.
S32	Potlatch State Park
S33	Squaxin Island S.P.
S34	Stretch Point S.P.
S35	Twanoh State Park
S36	Cutts Island Marine S.P.
S37	Eagle Island Marine S.P.
S38	Joemma Beach S.P.
S39	Kopachuck State Park
S40	Penrose Point S.P.
S41	Blind Island Marine S.P.
S42	Clark Island Marine S.P.
S43	Doe Island Marine S.P.
S44	James Island Marine S.P.
S45	Jones Island Marine S.P.
S46	Lime Kiln State Park
S47	Matia Island Marine S.P.
S48	Moran State Park
S49	Patos Island Marine S.P.
S50	Posey Island Marine S.P.
S51	Spencer Spit State Park
S52	Stuart Island Marine S.P.
S53	Sucia Island Marine S.P.
S54	Turn Island Marine S.P.
S55	Bay View State Park
S56	Larrabee State Park
S57	Saddlebag Is. Marine S.P.
S58	Mukilteo State Park
S59	Tolmie State Park
S60	Birch Bay State Park

3.3 Limits of MPA Identification

This section provides detail on the types of protected areas and programs that were unable to be fully investigated for this study. Omitted areas and limiting factors are explained.

3.3.1 Chosen Limit of Size and Scope

In the interest of developing this study at a manageable size and within a reasonable scope, some MPA designation mechanisms were omitted or only partially investigated. A summary list of these areas is presented below, with further details and explanation mentioned throughout the institutional discussions contained within Section 4.0:

- Parks or other protected areas established by local government (counties or cities). With the exception of two city parks and one county park identified in this study and clearly functioning as MPAs, a very long list of local parks and other open space areas were not able to be accommodated in this study. It is believed that many of these areas may include intertidal components, and some of these may be established for and function to protect intertidal species, habitats or other marine values.
- Additional fishery management areas. This study has attempted to identify as MPAs those WDFW closed fishery areas providing long term protection for one or more species. While ten such areas are identified, (most designated as marine preserves and already recognized as MPAs) a more comprehensive study of closed fishery areas could potentially identify additional sites. Additional research is necessary to determine the intent, site-specificity, function and permanency of various closed areas throughout Puget Sound. For example, note the fishery-closure related sites listed in Appendix B under the "Potential/Possible" MPA category. A comprehensive fisheries management review might reveal additional MPAs, as distinguished from the complex mix of locations where WDFW closures are seasonal (as opposed to year-round) or periodic; involve specific gear restrictions, catch limits or other controls; are closed due to pollution and human health concerns; or are otherwise based on the needs of the fishery as it is pursued at a given time.
- Tribal-established MPAs or similar protected areas on intertidal tribal lands. While acknowledging that tribes of the region play an important role in the cooperative management and protection of marine resources, and hold interests and rights to harvest fish and shellfish, this study was not expanded to include an analysis of marine protected areas which might exist on tribal lands.
- Land trusts, conservation easements and other privately owned/protected tidelands (with the exception of seven preserves established by The Nature Conservancy and one preserve established by the San Juan Preservation Trust). Private sector efforts to preserve special lands, habitats, flora and fauna protect an unknown yet potentially significant amount of parcels containing privately-owned tidelands. This is an area requiring significant research if intertidal holdings and protection levels are to be determined, and one that is beyond the scope of this initial study.
- Intertidal lands held or managed by government agencies that exist without particular protected area designation titles, but which may to some extent function like MPAs. As a general approach, only those government agency managed intertidal and subtidal sites that could be linked to actual protected area designations or programs have been identified in this study as MPAs. This leaves out additional intertidal holdings that, while not labeled with a special designation title, still may function to protect intertidal habitat or associated marine resources. Areas like this might include various intertidal holdings of state resource management agencies, and restricted shoreline/intertidal areas under military control. In the interest that this study not grow to a scale requiring a comprehensive land use/ownership study for all of Puget Sound, these types of intertidal holdings were not investigated.
- Marine laboratories or other research stations established by private or local government entities. With the exception of the University of Washington's Friday Harbor Laboratories, this study has not investigated the

tideland ownership status and actions to protect intertidal areas at numerous marine laboratories throughout Puget Sound.

- Mitigation sites as a form of MPA. In an unknown and poorly-tracked number of cases throughout Puget Sound, mitigation projects have involved habitat preservation or restoration in the marine environment. While such sites might be considered MPAs, although perhaps only temporarily so, they have not been investigated in this study.
- The role of local land use management, comprehensive planning, and zoning as contributing to MPAs. These elements of coastal management represent an unexplored area that, upon further investigation beyond this study, would likely reveal additional local sites or supportive links to existing MPAs.

In addition to the above list, the institutional reviews provided in Section 4.1 through 4.5 mention specific sites or programs that hold the potential for serving as or supporting MPAs.

3.3.2 Information Accessibility and Uncertainty

In addition to the acknowledged areas omitted or receiving limited investigation in this study, a second important limiting factor influencing the comprehensiveness of MPA identification relates to the availability of information. As previously characterized, information is often lacking or difficult to find, especially that which is necessary to identify and understand the marine components and management of many protected areas. Because of this, some sites which would likely represent MPAs under the definition and parameters used in this study have not been identified.

Some elements, such as tidelands, proved to be particularly complex. Questions proving difficult to answer included those concerning boundaries, ownership, lease status, and tideland inclusion within protected area boundaries or site management scope. Other examples of information elements often proving difficult to obtain, understand or verify include: the determination of original objectives for a protected area; the extent to which intertidal areas are actually "managed" at a site; the determination of whether marine protection of some sort is actually a function of a protected area; and resolution of differing opinions on a variety of details. Addressing unknown or unclear elements such as these often required a level of assistance and research from individuals with access to internal records that was too extensive to be justified or deemed practical to pursue for this study. If such information were documented, more readily available or closer in form to meet the needs of this type of study, additional MPA sites, especially in intertidal areas, could likely be identified and represented.

[1] As presented in Section 2.1.1, an IUCN-adopted definition refers to a marine protected area as: "*Any area of intertidal or subtidal terrain, together with its overlying water and associated flora, fauna, historical and cultural features, which has been reserved by law or other effective means to protect part or all of the enclosed environment"* (IUCN 1988).